AMENDMENT TO THE CLAIMS

1. (Currently Amended) An optical Code Division Multiple Access (CDMA) transmitting apparatus for transmitting bipolar data, comprising:

an optical CDMA encoding means for encoding a light from outside into a code (Cn) and a complement code ($\overline{Cn}$) of the code to generate ~~an~~ a first encoded light into the code and ~~an~~ a second encoded light into the complement code;

an optical modulation means for selecting and transmitting one of the encoded lights into the code and the complement code of the code based on the polarity (`0` or `1`) of ~~the~~ data inputted from the outside; and

an optical circulator in the optical CDMA encoding means for transmitting the light to the optical modulation means through at least one filter to form the second encoded light, and for receiving the first encoded light from the at least one filter and then ~~transmitting~~ forwarding the first encoded light into the optical modulation means~~, the optical circulator being optically coupled to at least one filter~~.

2. (Currently Amended) The optical CDMA transmitting apparatus as recited in claim 1, wherein the optical CDMA encoding means includes:

the optical circulator for transmitting the light from an external light source to optical fiber Bragg grating (FBG) filters, and transmitting to the optical modulation means the first encoded light into the code (Cn), which is obtained by reflecting the light in the optical FBG filters; and

the optical FBG filters for transmitting to the optical circulator the code, and transmitting to the optical modulation means the second encoded light into the complement code ($\overline{Cn}$) of the code, which is obtained by transmitting the light inputted from the optical circulator.

3. (Currently Amended) The optical CDMA transmitting apparatus as recited in claim 1, wherein the optical CDMA encoding means includes:

the optical circulator for transmitting the light from an external light source to a first diffraction grating, and transmitting to the optical modulation means the second encoded light into the complement code of the code, which is obtained by reflecting in a spatial filter;

the first diffraction grating for dividing the light inputted from the optical circulator for different paths based on the wavelength and transmitting the divided light to the spatial filter, and combining and transmitting to the optical circulator the second encoded light into the complement code which is obtained by reflecting the light in the spatial filter;

the spatial filter for transmitting to the first diffraction grating the second encoded light into the complement code of the code, which is obtained by reflecting the light inputted from the first diffraction grating, and transmitting to a second diffraction grating the first encoded light into the code, which is obtained by transmitting the light inputted from the first diffraction grating; and

the second diffraction grating for combining the first encoded light into the ~~codes~~ code from the ~~lights~~ light transmitted through the spatial filter, and transmitting the encode light into the code to the optical modulation means.

4. (Previously Presented) The optical CDMA transmitting apparatus as recited in claim 1, wherein the optical CDMA encoder performs encoding by using filters having an assignment of wavelengths for the light to be reflected or to be transmitted based on a modified pseudo-noise code.

5. (Currently Amended) An optical CDMA transmitting apparatus for transmitting bipolar data, comprising:

an optical modulation means for outputting a light from outside through a different output terminal based on the polarity (`0` or `1`) of data inputted from the outside;

an optical CDMA encoding means for receiving the light outputted from a first output terminal of the optical modulation means, and encoding the light into a first encoded light with a code (Cn); and receiving the light outputted from a second output terminal of the optical modulation means, and encoding the light into a second encoded light with a complement code ($\overline{Cn}$) of the code; and

an optical circulator in the optical CDMA encoding means for forwarding the light received from the first output terminal of the optical modulation means to filters and then receiving reflected light from the filters as the first encoded light, and for receiving the light transmitted from the optical modulation means through the filters as the second encoded light

~~for transmitting the encoded light into the optical modulation means, the optical circulator being optically coupled to filters~~.

6. (Currently Amended) The optical CDMA transmitting apparatus as recited in claim 5, wherein the optical CDMA encoding means includes:

the optical circulator for receiving the light outputted from the first output terminal of the optical modulation means and inputting the light to optical FBG filters in a reverse direction, and then outputting through an output terminal the first encoded light into the code (Cn), which is obtained by reflecting the light in the optical FBG filters, and outputting through the output terminal the second encoded light into the complement code ($\overline{Cn}$), which is obtained by transmitting the light through the optical FBG filters~~encoding the light into the code~~; and

the optical FBG filters for transmitting to the optical circulator the first encoded light into the code, which is obtained by reflecting the light inputted to the reverse direction from the optical circulator, and transmitting to the optical circulator the second encoded light into the complement code ($\overline{Cn}$) of the code, which is obtained by transmitting the light from the second output terminal of the optical modulation means.

7. (Previously Presented) The optical CDMA transmitting apparatus as recited in claim 5, wherein the optical CDMA encoder performs encoding by using the filters having an assignment of wavelengths for the light to be reflected or to be transmitted based on a modified pseudo-noise code.

8. (Currently Amended) An optical CDMA transmitting apparatus for transmitting bipolar data, comprising:

a first light source, which is turned on based on data inputted from outside, for outputting a light;

a second light source, which is turned on in opposition to the first light source, for outputting a light;

an optical CDMA encoding means for receiving the light outputted from the second light source, encoding the light into a code (Cn); or receiving the light outputted from the first light

source, encoding the light into a complement code ($\overline{Cn}$) of the code, and then transmitting the code or the complement code; and

an optical circulator in the optical CDMA encoding means for forwarding the light received from the second light source to filters and then receiving reflected light from the filters as the first encoded light, and for receiving the light transmitted from the first light source through the filters as the second encoded light~~for transmitting the encoded light, the optical circulator being optically coupled to filters~~.

9. (Currently Amended) The optical CDMA transmitting apparatus as recited in claim 8, wherein the optical CDMA encoding means includes:

the optical circulator for receiving the light outputted from the second light source and inputting the light to optical FBG filters in a reverse direction, and outputting through an output terminal the first encoded light into the code (Cn), which is obtained by reflecting the light in the FBG filters, and outputting through the output terminal the second encoded light into the complement code ($\overline{Cn}$), which is obtained by transmitting the light through the optical FBG filters; and

the optical FBG filters for transmitting to the optical circulator the first encoded light into the code (Cn) by reflecting the light inputted in the reverse direction from the optical circulator, and transmitting to the optical circulator the second encoded light into the complement code ($\overline{Cn}$) of the code by transmitting the light outputted from the first light source.

10. (Previously Presented) The optical CDMA transmitting apparatus as recited in claim 8, wherein the optical CDMA encoder performs encoding by using the filters having an assignment of wavelengths for the light to be reflected or to be transmitted based on a modified pseudo-noise code.

11. (Currently Amended) An optical CDMA transmitting method used in an optical CDMA transmitting apparatus for transmitting bipolar data, comprising the steps of:

a) encoding a light into a first encoded light with a code or a second encoded light with a complement code of the code; and

b) transmitting the first encoded light ~~into the code~~ or the ~~complement code~~second encoded light based on the polarity (`0` or `1`) of data to be transmitted by using one optical modulator,

wherein ~~the encoding~~ the light is encoded into the second encoded light by transmitting the light through filters, and the light is encoded into the first encoded light by reflecting the light in the filters based on an optical circulator and a filter set~~code or the complement code is performed according to a modified pseudo-noise code that has equal number of ones and zeros~~.

12. (Currently Amended) The optical CDMA transmitting method as recited in claim 11, wherein the step of encoding the light into the code or the complement code is performed by using the filters having an assignment of wavelengths for the lights to be reflected or to be transmitted based on ~~the~~ a modified pseudo-noise code.

13. (Currently Amended) An optical CDMA transmitting method used in an optical CDMA transmitting apparatus for transmitting bipolar data, comprising the steps of:

a) outputting a light through a different output terminal based on the polarity (`0` or `1`) of data to be transmitted; and

b) encoding the light outputted through a first output terminal into a first encoded light with a code between the lights outputted in the step a), and encoding the light outputted through a second output terminal into a second encoded light with a complement code of the code among the lights outputted in the step a), and then transmitting the first encoded light ~~into the code~~ or the ~~complement code~~second encoded light,

wherein the light is encoded into the second encoded light by transmitting the light through filters, and the light is encoded into the first encoded light by reflecting the light in the filters based on an optical circulator and a filter set~~the encoding the light into the code or the complement code is performed according to a modified pseudo-noise code that has equal number of ones and zeros~~.

14. (Currently Amended) The optical CDMA transmitting method as recited in claim 13, wherein the step of encoding the light into the code and the complement code is performed by

using the filters having an assignment of wavelengths for the light to be reflected or to be transmitted based on ~~the~~ a modified pseudo-noise code.

15. (Currently Amended) An optical CDMA transmitting method used in an optical CDMA transmitting apparatus for transmitting bipolar data, comprising the steps of:

a) outputting a first light by turning on a first light source based on data to be transmitted;

b) outputting a second light by turning on a second light source in opposition to the step a) based on the data to be transmitted; and

c) encoding the second light into a first encoded light with a code, and encoding the first light into a second encoded light with a complement code of the code, and then transmitting the first encoded light ~~into the code~~ or the ~~complement code~~second encoded light,

wherein the light is encoded into the second encoded light by transmitting the light through filters, and the light is encoded into the first encoded light by reflecting the light in the filters based on an optical circulator and a filter set~~the encoding the light into the code or the complement code is performed according to a modified pseudo-noise code that has equal number of ones and zeros~~.

16. (Currently Amended) The optical CDMA transmitting method as recited in claim 15, wherein the step of encoding the light into the code or the complement code is performed by using the filters having an assignment of wavelengths for the lights to be reflected or to be transmitted based on ~~the~~ a modified pseudo-noise code.